

XVI. *On certain Nycteribiidæ, with descriptions of two new species from Formosa.* By HUGH SCOTT, B.A. (Cantab.). Communicated by DR. DAVID SHARP, M.A., F.R.S.

[Read June 3, 1908.]

PLATE XVIII.

IN dealing with these species of Nycteribiidæ, I wish to express my thanks to Dr. P. Speiser, the well-known authority on this family of insects, for kindly examining specimens of the forms here described, and for giving me much guidance. Of the first 3 species—*Penicillidia jenynsi*, *Nycteribia insolita* and *N. sauteri*—all the specimens which I have seen were sent from Formosa, together with the bats from which they had been taken. Both parasites and hosts are in the Cambridge University Museum of Zoology, which is indebted for them to the enterprising naturalist, Herr H. Sauter. The four bats on which the Nycteribiids were found belong to a very widely distributed form, *Miniopterus schreibersii*, Natterer.* The labels with all the specimens record the same date and locality, Tainau, Formosa, 7, X, 1906. The bats bore labels with the numbers 5080, 5081, 5083, 5085; the Nycteribiids were sent in spirit in 4 tubes, with 4 labels bearing corresponding numbers. Thus all the parasites contained in a single tube were evidently found on a single bat-individual.

An interesting fact can then be noted with regard to the natural history of the Nycteribiids. It is that 3 distinct species of Nycteribiidæ, belonging to 2 genera, were found on four individuals of the same species of bat: while in three cases, 2 distinct genera of the parasites were found on a single individual of the host. Thus:—

* One of these specimens was seen several months ago, at the British Museum of Natural History, by Dr. K. Andersen of Copenhagen. Dr. Andersen stated that it was one of the forms at present known as *M. schreibersii*, but that that species will probably have to be divided into several species.

- On the bat numbered 5080 were found *Penicillidia jenynsi* 1 ♀, and *Nycteribia sauteri* 1 ♂ and 1 ♀.
 On the bat numbered 5081 were found *P. jenynsi* 1 ♂ and 1 ♀, and *N. insolita* 1 ♂.
 On the bat numbered 5083 were found *P. jenynsi* 1 ♀ and 1 larva, and *N. insolita* 2 ♀ ♀.
 On the bat numbered 5085, 2 ♀ ♀ *N. insolita*.

PENICILLIDIA, KOLENATI.

Penicillidia jenynsi, Westwood.

Nycteribia jenynsi, Westw., Tr. Zool. Soc. London, I, 1835, p. 291; Kolenati, Horæ Soc. ent. Ross. II, 1863, p. 88.
Penicillidia jenynsi (Westw.), Speiser, Arch. Naturg. 67 (1) 1901, p. 38.

1 ♂ and 3 ♀ ♀ (and 1 larva) sent from Tainau, Formosa; found on *Miniopterus schreibersii* (H. Sauter). Type ♀ and the other specimens in the Cambridge Museum. The ♀ is here described for the first time, only the ♂ having been known hitherto.

Dr. P. Speiser informs me, after examining some of the specimens, that they belong to the species regarded by him as *P. jenynsi*, and described by him (*l. c.*) under that name. As Westwood's type of *P. jenynsi* unfortunately cannot be found, it has not been possible to make a comparison in order to ascertain whether the form under consideration is certainly identical with the *P. jenynsi* of Westwood.

The colour of the firmly chitinised parts is rather pale yellowish-brown. Both sexes agree with Speiser's description in the following particulars: length about 2.5 mm.; head with numerous strong bristles between the eyes; the bristles continue down the margins of, but are absent from the surface of, the cheeks; maxillary palps with numerous strong bristles, the terminal ones very long; under surface of thorax * markedly curved in the longitudinal direction, with a dark middle line somewhat impressed at the ends. The legs are as described by Speiser.

* The curvature of the surface renders it hard to estimate correctly the proportion of length to breadth. In the table given by Speiser (*op. cit.*, p. 66) *P. jenynsi* is placed in a section of the genus in which the thorax is longer than broad. In the specimens from Formosa the breadth appears at any rate equal to, if not slightly greater than, the length.

ABDOMEN OF THE ♂. (Fig. 1 dorsal, Fig. 2 ventral view.)—The abdomen of the specimen from Formosa disagrees in some small details with Speiser's description. Tergites 2, 3 and 4 have short bristles on their surface, in addition to the long bristles on their hind margins. The anal segment has scanty bristles on its surface, as well as at its hind corners. Of the sternites, only the basal one has fine bristles on its surface. Sternites 2, 3 and 4 are quite bald, except for the fine bristles along their hind margins. As in the ♀, the basal sternite bears some long bristles rather far apart, just in front of the ctenidium.

ABDOMEN OF THE ♀. (Fig. 3 dorsal, Fig. 4 ventral view.)—The distinguishing characters of the ♀, now described for the first time, lie in the form of the abdomen.

Basal tergite firmly chitinised, with conspicuously rounded hind margin; quite bald, except for 2 groups of 4-6 strong, moderately long bristles on the hind margin, one group immediately on either side of the middle line. *Tergite 2* rather long, firmly chitinised, with hind border much less curved; the surface quite bald, hind margin set with strong bristles of varying length, at the sides moderately long, in the middle very long but not very close. *Tergite 3* consisting anteriorly of soft whitish, extensible skin, quite bald; posteriorly of a yellowish chitinised portion more than four times as broad as long (Fig. 3a), its surface bald or with few short bristles, its hind margin bearing strong bristles of varying and alternating lengths, some very long. *Anal segment* firmly chitinised (except right at the base), truncated-conical, its length about equal to its breadth at the base, breadth at apex less than $\frac{1}{2}$ that at base; base bald, followed by area bearing strong outstanding moderately long bristles rather far apart; posterior part of segment quite bald; hind margin bearing several rather short bristles, with a long bristle at either angle.

Basal sternite large, with scanty short fine bristles on the surface except in the median-basal part, and with a row of long bristles a little before the hind margin; ctenidium not strongly developed, teeth in the middle rather far apart. Next follows a large area of soft whitish extensible skin, with numerous rather short strong bristles, and 8 long ones arranged in a curved transverse row (Fig. 4a). Beyond this area are two oval, rather convex, chitinous plates (Fig. 4b), nearly touching at the middle line; their basal portions bald, posterior portions with a few short strong bristles, hind margins with a number of moderately and very long strong bristles. Immediately behind these plates is a short chitinous segment (Fig. 4c), extending across the body, its hind margin bearing short bristles medially, very long strong bristles on either side. Behind this, just in front of the genital opening, is a chitinous plate (Fig. 5), as long as or longer

than broad, with its hind margin deeply and rather widely emarginate; its base is bald, the rest of its surface bears strong, but not very long bristles; those at its hind angles are longer. At the base of this plate is a dense group of strong dark spines on either side of the body. Ventral surface of anal segment bearing some long bristles medially.

Dr. Speiser has recently described* a new species, *P. leptothrinax*, from Madagascar. This is closely allied to *P. jenyysi*. Judging from Speiser's description, the ♂♂ of the two species are very much alike. Speiser states that the ♂ *P. leptothrinax* is distinguished "durch die wesentlich dichter und auch auf der Fläche beborsteten Tergitplatten." In the ♂ *P. jenyysi* from Formosa, however, as stated above tergites 2-4 bear bristles on their surfaces as well as their hind margins. It may also be pointed out that the row of long bristles just in front of the abdominal ctenidium in both sexes, is present in the Formosan specimens of *P. jenyysi* as well as *P. leptothrinax*.

However much alike the males may be, there are distinct differences in the females of the two species. The basal tergite of *P. jenyysi* ♀ is of very distinctive form. Instead of the two pairs of chitinous elevations on the dorsal surface of the abdomen in *P. leptothrinax* ♂, *P. jenyysi* has the single transverse chitinous piece (Fig. 3a). Ventrally, the one pair of well-defined chitinous plates (Fig. 4b) followed by the chitinous segment (Fig. 4c) are distinctive and characteristic of *P. jenyysi*. In the conspicuously emarginate plate before the genital aperture (Fig. 5), *P. jenyysi* ♀ seems to approach somewhat to *P. eucesta*, Speiser.

LARVA. (Figs. 6, 7, 8).—One ♀ specimen was found to be carrying a larva, which projected behind it; all the body of the larva was outside that of the adult, except a small anterior portion which was still within the widely-opened genital aperture. The larva, when completely freed from the adult, was found to have not the simple ellipsoidal form of previously described Nycteribiid larvæ, but the form shown in Fig. 6, the small anterior portion which was still within the body of the mother being marked off from the rest by a sharp constriction. The anterior surface of this constricted part is somewhat flattened in a nearly vertical direction

* Voeltzkow, Reise in Ostafrika in den Jahren 1903-1905, II, 1908, p. 199. (Stuttgart).

(Fig. 7). In the upper part of this anterior sloping surface is the mouth (Fig. 8c), which in this specimen was covered by a brownish mass (figs. 7a, 8a), apparently of cuticular substance, attached to the surface of the larva by its upper edge as by a hinge. In Fig. 8a it is shown lifted up to expose the mouth aperture. On the ventral surface of this anterior constricted part of the larva, a little behind its front edge, there are in the middle two small flattened pieces with rounded apices (Figs. 7b, 8b), close together and projecting downwards. The skin of the larva bears some fine longitudinal creases in the region of the constriction.

It is quite uncertain whether the anterior constriction of the larva is merely accidental or not. There is the possibility that the larva was leaving the genital aperture of the adult at the time when the latter was captured, and that at death the abdomen of the adult contracted on the larva, constricting it forcibly. On the other hand, the constriction is extremely regular in its formation, as though it might be natural to the larva. One may quote an observation recorded in an as yet unpublished paper by Mr. F. Muir, who investigated the anatomy of certain Nycteribiids in the island of Larat (Timorlaut Islands). He states that the larvæ had "a constriction at the anterior end cutting off a small mass"; he speaks of the mouth as being on this small mass, but says that no signs of mouth-organs were visible. I understand from Mr. Muir's paper that this refers to larvæ which he found by dissection still in the uteri of the adults. The brownish mass closing the mouth aperture in my specimen is probably no more than a mass of cast skin. But the two small structures (Figs. 7b, 8b) appear too regular in form to be in any way accidental. Were it not that they are placed below, and so far away from, the mouth, one might consider them to be rudimentary mouth-organs such as have been described by Leuchart* and Pratt† in the larva of *Melophagus ovinus*. Such mouth-parts have not been seen in Nycteribiid larvæ‡ previously described.

For the rest, the larva of *P. jennyssi* agrees with the general description of Nycteribiid larvæ given by Speiser. It is yellowish-white (preserved in spirit), slightly flattened dorsoventrally. It has the usual 2 pairs of spiracles

* Abh. Naturf. Ges. Halle IV, 1853, p. 176 and Taf. 3, Figs. 1, 2.

† Arch. Naturg. 59 (1), 1893, pp. 156, 165.

‡ Speiser, Arch. Naturg. 67 (1), 1901, p. 28.

situated dorsally and posteriorly (Fig. 6): one pair, only separated from one another by a distance = 1 to 2 diameters of the spiracle, quite close to the posterior extremity of the body; the other pair, separated from one another by a considerable distance, and about $\frac{1}{4}$ the length of the body from its hind end. The ventral surface of the larva shows the peculiar configuration mentioned by Speiser (*op. cit.*, p. 27). There is a median area sunk slightly below the level of the surrounding body-surface, with its cuticle much wrinkled and creased longitudinally, the creases continuing in front along the ventral surface of the constricted part of the larva's body. The cuticle of the surrounding body-surface, where it edges on and slightly overhangs the median area, has a different appearance, being marked with fine creases radiating from the edge of that area.

NYCTERIBIA, LATREILLE.

Subgenus *LISTROPODIA*, Kolenati.

Nycteribia (Listropodia) insolita, sp. nov.

Pallide flavescens; thorace subtus longiore quam lato; femoribus tibiisque latis; abdominis segmento ventrali basali in medio longitudinaliter impresso.

♂ segmentum anale longum, angustum, postice vix angustatum, apice truncato.

♀ segmentum anale conspicue bilobatum, laminis duabus lateralibus productis, superficie internâ concavis.

Long. corp. 1.5 mm.—1.75 mm.

1 ♂ and 3 ♀♀ sent from Tainau, Formosa (Sauter); found on *Miniopterus schreibersii*. Type ♂, type ♀, and the 2 other ♀♀ in the Cambridge Museum.

Head bare, except for a few short bristles in the middle in front, and along the cheek-margins. Maxillary palpi with very long terminal bristles. Thorax dorsally with a curved row of bristles on either side. Thorax ventrally a little longer than broad, rounded in front, with a brownish middle line somewhat impressed at the ends; surface of the thorax bearing the usual short bristles, and on its hind margin 4 long ones, of which the two outer are very long. Femora and tibiæ (Fig. 13) flattened, each about $2\frac{1}{3}$ times as long as its greatest breadth. The femora bare on one surface and bristle-

bearing on the other ; in the anterior pair, the outer posterior surface is bare ; in the middle and posterior pairs the anterior surface is bare. Lower edges of the femora curving up a little abruptly at their distal ends. Tibiæ with bristles on the upper edge, and 3 cross rows of strong dark bristles on the lower edge distally. There are one or two very long outstanding bristles on the lower edge of the femur and the upper edge of the tibia.

ABDOMEN OF THE ♂. (Fig. 9.)—Long and narrow. Excluding the anal segment, 5 distinct tergites can be seen, but the basal one is longer, and really consists of two segments partially fused together, the line of division between them being visible in some aspects : I shall, however, consider them as a single tergite, no. 1 (Fig. 9a).

This *Tergite* 1 with numerous very short bristles on its surface, rather longer ones on its hind margin. *Tergite* 2 with few bristles on its surface ; with bristles of varying lengths, some fairly long, on its hind margin. *Tergite* 3, 4, 5 bare on the surface, their hind margins set with short stiff spines, alternating with every two or three of which are long bristles, the 4 nearest the middle line being very long. *Anal segment* strikingly long and narrow (about $1\frac{2}{3}$ times as long as broad), not tapering ; the surface in the middle bears a very few scattered short stiff bristles, and there are a few more such bristles, alternating with rather longer ones, on the hind border.

Basal sternite somewhat impressed along the middle line, with not very short bristles on its surface ; ctenidium well developed, the teeth close, shorter in the middle, so that the outline of their apices appears sinuate. *Sternites* 2, 3, 4, without very definite marginal rows of bristles, but with rather scattered strong bristles (some on the surfaces as well as on the margins) mostly of moderate length, some of those at the sides being very long. *Sternite* 4 bears in the middle part of its hind margin, about 4 stiff spines rather far apart. *Claspers* (Fig. 10) long, slender, slightly curved outwards in the distal half, curved in again at the apices, which are dark.

ABDOMEN OF THE ♀. (Figs. 11 and 12.)—Rather long and narrow. Excluding the anal segment, 3 dorsal plates (tergites) are distinguishable. *Tergite* 1 (Fig. 11a) small, with very short fine bristles on the surface, slightly longer at the hind margin. *Tergite* 2 (Fig. 11b) in some specimens bare, in others with very short bristles, on its surface ; hind margin bearing very long fine bristles and some small short spines. Between tergites 2 and 3, an area of whitish extensible skin bearing numerous rather strong short bristles, longer at the hind margin. *Tergite* 3 (Fig. 11c) a bare chitinous plate, bearing only 4 very long outstanding bristles far apart, and strong short spines along its hind margin. *Anal segment* composed of two lateral pieces—with

convex outer surfaces, inner surfaces somewhat concave, and apices rounded enclosing a median portion (Fig. 11*d*) only about $\frac{1}{2}$ as long as the lateral parts; the latter have a few short bristles on their outer surfaces, longer strong bristles apically; the median part has 2 rather long fine bristles on its hind margin.

Basal sternite as in the ♂.—[Owing to softness and shrinkage it is impossible to estimate correctly the relative lengths of sternites 2, 3 and 4.] *Sternites* 2, 3 soft, short, with long bristles not close on the hind margins, and very short fine bristles on the posterior part of their surfaces. *Sternite* 4 with long bristles on its hind margin, and a few short ones on its surface. *Sternite* 5 is a long chitinous plate (Fig. 12*a*) appearing as if composed of two segments fused; at about $\frac{1}{3}$ the length from its base is a transverse row of long and short bristles (marking the limit of one component sternite), and its hind margin also bears long and short bristles; rest of its surface bare. *Anal segment* ventrally appearing rather long and narrow, markedly emarginate in the middle of its hind border, with rounded corners, a median longitudinal impression, and a few bristles distally.

The curiously formed ♀ anal segment of *N. insolita* somewhat resembles that of *N. blasii*, Kolenati, and of *N. pedicularia*, Latr. (= *N. latreillei*, Leach), in both of which the segment has produced lateral plates. *N. insolita* is distinguished by its smaller size, and by the thorax ventrally being longer than broad; the possession of the long chitinous ventral plate (sternite 5) also is characteristic. The ♂ also resembles *N. blasii* somewhat in having a long anal segment, but differs in the form of the thorax, etc.

Nycteribia (Listropodia) sauteri, sp. nov.

Pallide flavescens; thorace subtus perparum latiore quam longo; femoribus tibiisque parum latis.

♂ segmentum anale supra brevissimum, subtus longius, apice lato.

♀ segmentum dorsale 2 curtum, læve, superficie sine capillis: segmenta ventralia 3 et 4 utrumque laminis duabus perparum elevatis: segmentum anale æque longum ac in basi latum, postice angustatum, subtus utrinque tuberculis duobus obtusis parum elevatis.

Long, corp. circa 1.25 mm.

1 ♂ and 1 ♀ sent from Tainau, Formosa (H. Sauter); found on a single individual of *Miniopterus schreibersii* Type ♂ in the Cambridge Museum. The ♀ was unfor-

tunately lost, but luckily this did not occur till after it had been closely examined, and figured.

Although the femora and tibiæ are not very broad, and the ♂ has a very short anal segment, yet it does not seem possible to place this species in any subgenus but *Listropodia*.

Head with short bristles along the cheek-margins, and with a few at the front margin of the crown: otherwise bare. Thorax dorsally with a curved row of bristles on either side. Thorax ventrally very slightly broader than long, flat, with the portions anterior to the oblique lines sloping upwards somewhat: middle line red-brown, impressed posteriorly, and also slightly anteriorly: surface as usual bearing fine bristles, with some longer ones at the hind margin, of which two are very long. Femora and tibiæ (Fig. 14) not very broad: greatest breadth of femur = only a little over $\frac{1}{3}$ its length; that of the tibiæ = $\frac{1}{3}$ its length. Femora and tibiæ of the ♀ slightly broader than those of the ♂. Tibiæ with the usual 3 cross-rows of bristles on their lower side distally.

ABDOMEN OF THE ♂. (Figs. 15 and 16).—Long and narrow. Excluding the anal segment, 5 dorsal segments (tergites) are visible: the first is really composed of 2, but the small basal one is not very sharply delineated, and is hard to see; this compound tergite is here reckoned as No. 1 (Fig. 15a.) Tergites 1, 2, with short bristles over their surfaces, long ones on their hind margins. Tergite 3 with a few rather longer bristles on the surface, long bristles on its hind margin. Tergites 4, 5 bare on the surface, their hind margins set with short stiff spines, between every 2 or 3 of which are long bristles, 2 near the middle of tergite 5 being very long. Anal segment viewed from above remarkably short, only about $\frac{1}{2}$ as long as broad: hind margin not rectilinearly truncate, but forming a slightly concave curve: dorsal surface bare, sides and hind angles bearing strong bristles.

Basal sternite without median impression, bearing fine bristles not very close: ctenidium well-developed, its margin scarcely sinuate. Of sternites 2, 3, 4, no. 3 is longest; nos. 2 and 3 have a few short bristles on the surface, no. 4 is almost bare: their hind margins bear bristles of very varying length, not very close, some (especially at the sides) being very long and strong. Anal segment ventrally much longer than dorsally, its length nearly = its breadth at the base, its apical breadth = a little over $\frac{1}{2}$ its basal breadth: surface bare, except for two divergent rows of bristles, one on either side, commencing at the edge of the cavity in which the claspers lie, and running outwards and backwards from near the apex of this cavity to the side of the segment. Claspers narrow, rather short, with

apex sharp and not dark, with no marked curve in the horizontal plane, and with bristles (growing shorter towards apex) extending from base almost to extreme apex.

ABDOMEN OF ♀. (Figs. 17 and 18.)—*Basal tergite* small, bearing short bristles on its surface, with no long bristles on its hind margin. *Tergite 2* (Fig. 17a) short, its surface bare, its hind margin set with long bristles. Line of division between tergites 1 and 2 not very definite in all aspects. Beyond tergite 2 an area of soft skin bearing rather short bristles, not close, and some long ones posteriorly. This area terminates in a *chitinous plate* (Fig. 17b) nearly twice as broad as long, bare on its surface; its hind margin bears 4 very long bristles set apart, and between each 2 of them are 2 or 3 short dark spines. *Anal segments* short, its basal breadth quite equal to its length; the segment tapers somewhat, but has its apical breadth = more than $\frac{1}{2}$ its basal breadth; surface almost bare, a few moderately long bristles at the hind corners.

Basal sternite as in the ♂. *Sternite 2* with about 2 irregular rows of short bristles on its surface, its hind margin bearing long bristles. *Sternites 3, 4* each bearing a pair of slightly elevated chitinous pieces (Fig. 18a) separated by a small interval at the middle line: hind margins of these pieces bearing long bristles; and those of sternite 3 also bearing short bristles on the surface. *Anal segment* ventrally showing 2 pairs of blunt rounded lateral elevations, which bear moderately long bristles: also some short bristles on the surface of the segment near its base, and some moderately long ones at its hind border.

In the shortness of the anal segment in the ♂, this species resembles *N. stylidiopsis*, Speiser; * but the ♂ anal segment of *N. sauteri* is dorsally even shorter than that of *N. stylidiopsis*. The ♀♀ of the two species differ in the form of the anal segment and in other respects. *N. stylidiopsis* also has the thorax longer than broad; and *N. sauteri* has the legs only moderately broad.

CYCLOPODIA, KOLENATI.

Cyclopodia roylei, Westwood.

Nycteribia roylei, Westw. Tr. Zool. Soc., London, I, 1835, p. 290; Speiser, Arch. Naturg. 67 (1) 1901, pp. 62, 68.

* In Voeltzkow, Reise in Ost-Afrika, 1903-1905, II, 1908, p. 200. (Stuttgart.)

Acting on Dr. Speiser's suggestion, I have examined Westwood's original type of this species. I am indebted to Professor Poulton for lending it from the Oxford Museum.

In general form, and in the possession of long thin legs with 3 distinct rings on the tibiae, this species is, as conjectured by Dr. Speiser, undoubtedly a *Cyclopodia*. Only in the form of the eyes is it not quite certain whether it agrees with other members of the genus. After close examination I cannot be quite sure whether those organs are composed of only a single ocellus, or of more than one. To all appearance each eye consists of only one ocellus. Should this be so, either the presence of several ocelli can no longer be used as a sure criterion of the genus *Cyclopodia* at all, or the genus must be divided into subgenera characterised by the numbers of the ocelli.

The following particulars as to the type, which is preserved dry, will probably amplify previous descriptions.

♂. Length 2.75 mm. Colour dark brown, legs lighter. Thorax ventrally as broad as long, middle line with a rather deep impression at the hind end. Front coxæ not at all elongate (no longer than hind coxæ), nor thickened. Rest of front legs missing from the specimen, other legs offering no peculiarities.

ABDOMEN. (Fig. 19.)—The 5 tergites all bare on the surface; the rows of bristles on their hind margins extending right across the abdomen. Tergites 2 and 3 are long; 4 is shorter; 5 short, only $\frac{1}{2}$ as long as 3. Anal segment not long but rather conspicuously tapering; it is almost as long as tergites 4 and 5 together; its length is not quite = its breadth at the base, its breadth at the apex is less than $\frac{1}{2}$ that at the base; surface bare, hind margin with bristles, longer at the sides.—Basal sternite with a median longitudinal impression, bare at the base, and with short bristles on the rest of its surface; appearing rather long and narrow, but perhaps the basal part would normally be hid under the thorax. Sternites 2, 3 with short bristles on the surface, scanty in 3: with no definite rows of bristles apparent on their hind margins, only a few very small spines laterally in sternite 3. Sternite 4 quite bare on the surface, the hind margin having a small ctenidium medially and on either side of this long bristles. Claspers long, narrow, and sharp at the apex, which is distant by about $\frac{1}{3}$ the length of the anal segment from the hind margin of the segment in front.

“Habitat in India orientali” (Westwood.)

TRANS. ENT. SOC. LOND. 1908.—PART II. (SEPT.) 24

Judging from descriptions in Speiser's article cited above, this species would appear to be quite distinct from any other described species of *Cyclopodia*. The fact that the rows of bristles on the margins of the dorsal segments are continuous across the abdomen, and that the claspers do not reach the hind margin of the penultimate segment, seems to ally it to *C. dubia*, Westw. and *C. minor*, Speiser; but its size is smaller, and its anal segment apparently shorter. The shortness of the front coxæ is a good character; and there is also the point mentioned above about the eyes.

EXPLANATION OF PLATE XVIII.

[See *Explanation facing the PLATE.*]